de maximis, inc.
P.O. Box 90348
Knoxville, TN 37990
615-691-5052

Site: SCRDI Bluff
Break: 3.4
Other:

January 31, 1989

Michelle M. Glenn
USEPA Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

SUBJECT: SCRDI-Bluff Road Site
Draft Proposal for Permanent Well Locations

Dear Ms. Glenn:

In an effort to provide as much information as possible prior to our February 1, 1989 meeting, I am telefaxing the following information to you and SCDHEC:

*December 1988 sampling results from the Golder wells in a preliminary format to include a rough iso-concentration drawing for total VOC's;

*A synopsis of the temporary well effort; and

*A justification for the permanent well location map sent to you under separate cover.

We look forward to our meeting tomorrow. Please contact me if you have further questions concerning the enclosed information.

Sincerely,

Michael A. Miller

Michael A. Miller, P.E.
Senior Project Manager

cc: Lorelei Borland
Coleman Miles - SCDHEC
IT Corp.

Enclosures

BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA
JANUARY 31, 1989

JUSTIFICATION FOR PLACEMENT OF NEW PERMANENT GROUND WATER MONITORING WELLS (TOTAL - 19)

* Four wells monitoring the deep aquifer:

-Good triangulation to determine potentiometric surface of deep aquifer and direction of water flow; and

-Deep wells 1a, 2a, 3a and 4a will evaluate potential contamination in source, near source or known areas of contamination (shallow aquifer).

*Shallow aquifer well pairs:

-Determine whether the plume is vertically differentiated into zones of low- and high-density contaminants at 2b and 2c, 4b and 4c, and 11a and 11b;

-To monitor beyond the farthest projected down-gradient portions of the plume to determine if plume is moving more quickly in its upper or lower portions; and

-To monitor background in the same shallow aquifer zones as the downgradient pairs, 1b and 1c.

*Single shallow aquifer wells:

-Confirm aerial extent of contamination;

-Well depth to be confirmed by expedited well pair data; and

-Wells 5, 6 and 7 are to determine whether the contamination in P-18 is a result of lateral (cross-gradient) movement of the main plume or is potentially the result of a separate source.

BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA
JANUARY 31, 1989

PROPOSED EXCEPTIONS TO WELL-DRILLING PORTION OF THE EBASCO WORK PLAN

*For all shallow aquifer monitoring wells, 10 foot screens will be installed (will use two 5-ft threaded lengths);

*Rather than the specified 4-ft square concrete pad around each well, a minimum 2-ft diameter circular pad with a minimum thickness of 6 inches will be constructed such that the concrete pad slopes away from the well;

*Deep monitoring wells (confined aquifer) will have an outer PVC casing at least 6 inches in diameter. This will require a minimum 8 inch diameter hole to be drilled. Due to the depth of the deep aquifer wells, mud rotary is the preferred drilling method; and

10" hole
8" casing

*After installation of the outer PVC casing, the surrounding grout will be allowed to set a minimum of 24 hours.

approved verbally w/DHEC approval

CHRONOLOGY AND DIFFICULTIES OF WELL-POINT SAMPLING EFFORT AT THE BLUFF ROAD SITE

January 4, 1989

The first well-point sampling effort was at TW-11 using a permanent (fixed-tip) well point. The sampling team was only able to drive the system about 5 feet into the ground before the hard, clayey sand made penetration with the hand-driven hammer impossible. A review of drilling logs for the area showed that the soils are very resistant to penetration, requiring upwards of 60 blows for driving split spoons the final 6 inches. During decontamination procedures, it was noted that the slots in the well point were completely clogged with clay, preventing water from passing into the tube. Therefore, even if the aquifer had been reached, a sample could not have been collected.

January 5, 1989

After a study of the boring/well logs, a new sample location was chosen that was reported to lack the hard, clay-rich layer. This second well-point sampling effort was made at TW-15. The plan was to hand auger to about 9 feet and drive the well point through the final foot of confining layer into the aquifer so that the sample would not be diluted from surface water. This attempt was aborted for health and safety considerations because of high organic vapor analyzer readings in the auger hole.

Dan Thoman of the U.S. Environmental Protection Agency (EPA) ESD said that standard operating procedures required stainless steel sampling equipment and that aluminum shield points could jeopardize sample results. A decision was made by SLG and ADP to use stainless steel shield points (detachable, to prevent clogging of slots), although aluminum ones were immediately available. On January 5 the stainless steel points were ordered from KV. The full order was received on January 9. The delay was caused by a lack of materials in stock at KV and by the time required for custom fabrication.

January 7, 1989

The third well-point sampling effort was made at location TW-2, a background sample. Three different attempts were made to take a sample at this location.

First attempt: A hole was first made with a hand auger, but because of the

stiffness of the soil, progress was restricted to 2 to 3 feet per hour. After reaching 8 feet, an attempt was made to drive the rod through approximately 2 feet of confining, hard, clay-rich sand. Because of lack of support for the rod and the hardness of the soil, the aquifer was barely penetrated and no water was able to be pumped. The well point was removed and the hole abandoned and grouted because of freestanding water penetrating into the aquifer. Slots on the permanent tip were plugged with clay again; therefore, water could not pass into the center of the tube.

January 9, 1989

Second attempt: The team power augered with a rental unit (which had been sandblasted) to 4.5 feet, then hand augered to 10 feet and drove the well point to 13 feet, using a permanent tip. No water could be pulled. The system was removed from the hole and changed to a shield point that was driven into the aquifer. The team was unable to pull any water at 13 feet.

January 10, 1989

The system was pulled out of the aquifer. It was noted that the shield point had apparently slipped while being installed and was plugged up with clay to the point that it was wedged onto the shaft. The shield point was pulled off and a new one inserted and the system set up to drive 20 feet. The well point was driven to 20 feet but the shield point would not separate from the shaft. ADP tried pushing on the Teflon™ tube and forcing deionized water down the shaft and tube, but neither method loosened the tip. The hole was abandoned and the system pulled out, then the hole was grouted. It was noted that the 1/8-inch gap between the shield point and the shaft was filled with clay and that the shield point was wedged in place.

January 11, 1989

Third attempt at TW-2: The team power augered to about 5 feet and hand augered to 10 feet. The shield point was modified by welding 16 feet of 3/16-inch stainless steel rod to the top of the point. This was done to enable the point to be pushed down and a sample taken at 15 feet. About 600 milliliters (ml) water was collected with peristaltic pump system, but pumping rate was

very slow. Problems occurred with air bubbles forming in system, which would strip volatiles from the sample. The system was left in the hole overnight.

January 12, 1989

To eliminate the bubbles, as many shaft joints as possible were tightened, but this only reduced bubbles. After examining the connections, an air leak was found at the compression fitting on top of the shaft. The team was unable to get a good seal on compression fitting to the teflon tubing. Approximately 2 liters of water was pumped and approximately 250 ml was collected for metals analysis when the second in-line gas sampling bulb imploded. The effort was abandoned, but it was decided to upgrade and change the line and vacuum system because sampling required an unexpectedly high vacuum. De maximis was notified of continuing problems. IT was told to break off work as scheduled and plan to continue well-point sampling next week but as second priority to soil borings.

January 18, 1989

IT was notified to abandon well point effort.

PROJECT: BLUFF ROAD, SOUTH CAROLINA
PROJECT NUMBER: 409619

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SAMPLE NUMBER

ANALYTE (PPB)	DW-1 J0416	DW-1 J0408	DW-2 J0411	DW-3 J0415	P-6 J0389	P-7 J0397	P-8 J0425	P-9 J0424	P-10 J0422	P-11 J0409	P-12 J0413	P-13 J0414	P-14 J0407	P-15 J0419	P-16 J0418	P-17 J0389	P-18 J0400	P-19 J0401	P-20 J0388	P-21 J0402	P-22 J0398
Vinyl Chloride																	13				
Methylene Chloride			1*	2*		1*			44*				1,600		170*		5				1*
Acetone	5*	19*	9*	20*	7*		150	36	5,600	29	12*	11*	7,600	50	2,200	6*	20*	9*	16*	15*	7*
Carbon Disulfide																					
1,1-dichloroethene						7		31	320	40		36	1,300	12	640		260				11
1,1-dichloroethane								2	1600	7		75	2,900	20	1,900		160				
1,2-dichloroethene (XYLENE)								4	1700	13		39	1,900	42	1,300		250			4	
Chloroform						110	5	280	380	9		140	2,800	4	710		170				49
1,2-dichloroethane									160				100		120		37				
2-butanone													720		260						
Trichloroethene						100	2	8	120	2		16	330	2	210		77				8
1,1,1-trichloroethane						18	2	74	190	130		31	1,900	37	670		240				14
Benzene									28				110		70		9				
4-methyl-2-pentanone													270		77						
Tetrachloroethene						8	7	51	73	9	20	18	290		120		180		2		33
Toluene									410				860	4	620						
Ethylbenzene									160				76		77						
Total Xylenes									45				140		170		3				
1,1,2,2-Tetrachloroethane							2		120				180	6	140						24
Chlorobenzene													23								
CARBON TETRACHLORIDE							4	72	100								120		5	9	59
1,2 DICHLOROPROPANE													31		17		3				
1,1,2-TRICHLOROETHANE						6											89				2
TETRACHLOROMETHANE										6	3	5	11								
TOTAL VOLATILES	5	19	10	22	7	250	172	538	11,050	244	35	371	21,441	177	9,44	6	1,636	9	23	28	208
TAPE DOWN (FT)	15	15	16.7	15.75	13.1	13.0	12.9	13.0	14.1	12.4	10.8	14.7	13.6	12.2	13.2	9.1	13.7	13.2	7.25	13.8	13.1

PRELIMINARY

*Found in sample blanks at equivalent levels